Asphalt Pavement Association of Indiana, Inc.

Indiana

**ASPHALT PAVEMENT GUIDANCE SPECIFICATION FOR LOCAL AGENCIES**

This document is intended to provide recommended guidance for local government asphalt pavement applications. These specifications incorporate the latest asphalt paving technologies and presents best practices, procedures and processes but is not intended to replace sound engineering knowledge, judgment, and experience.

APAI recommends work shall be performed in accordance with the project specifications and the current Indiana Department of Transportation (INDOT) specifications, Section 402 – Hot Mix Pavement.

***DESIGN GUIDANCE***

**Conversions**

All asphalt mixture and #53 Compacted Aggregate bid items should be measured in weight (tons). To convert from roadway area (SY) and depth of material (in) to weight (tons):

$$Area (SY)×\frac{110 \frac{lbs}{SYD}}{2,000 \frac{lbs}{ton}}×Depth (in)=\\_\\_\\_ tons$$

Excavation Common bid item should be measured in volume (CYD). To convert from roadway length (ft), width (ft) and depth (ft) to volume (CYD):

$$\frac{L \left(ft\right)×W\left(ft\right)×D(ft)}{27\frac{ft^{3}}{CYD}}=\\_\\_\\_ CYD$$

**Lift Thicknesses**

INDOT design guidelines specify the following minimum and maximum finished lift thicknesses for mixture pavement size designations:

|  |  |  |  |
| --- | --- | --- | --- |
| Mixture Size Designation | Minimum Lift Thickness, in. | Maximum Lift Thickness, in. | Target HMA Layer Thickness, in. |
| 9.5 mm | 1.0 | 2.5 | 1.5 or 2.0 |
| 12.5 mm | 1.5 | 3.75 | 2.5 – 3.0 |
| 19.0 mm | 2.0 | 5.0 | 2.5 – 4.0 |
| 25.0 mm | 3.0 | 7.5 | 4.5 – 6.0 |

**Materials**

Asphalt Performance Grade (PG) binders for asphalt pavement shall be supplied by an INDOT approved supplier listed on INDOT’s Qualified Sources List for Performance-Graded Asphalt Binder Suppliers and shall meet the requirements of Section 902.01 (a). Aggregate materials used in asphalt mixtures shall be supplied by a source listed on INDOT’s Qualified Sources Lists for Certified Aggregate Producer as well as the qualified list for Dolomite Aggregates and Polish Resistant Aggregates when applicable. Aggregates shall meet the requirements of Section 904. The asphalt mixture design mix formula (DMF) shall be prepared by an INDOT Qualified Mix Design Laboratory. An Agency may request a DMF to be submitted for approval prior to paving.

The DMF shall be based on the mixture type, mixture size, and PG binder designation. In the construction season of 2025, Indiana’s base binder grade will change from PG 64-22 to PG 58-28. Along with this change, the asphalt binder designations and testing requirements will be in accordance with Multiple Stress Creep Recovery (MSCR) per AASHTO M332 and elastic response requirements per AASHTO R92. These changes are encouraged prior to the 2025 construction season if the Contractor can do so. Any references to asphalt PG binders henceforth in this document will refer to the PG 58-28 MSCR binder specifications.

|  |  |  |
| --- | --- | --- |
| ***Current******PG Binder Designation*** | ***2025 MSCR Binder Designation*** | ***MSCR Binder Traffic Designation*** |
| PG 64-22 | PG 58S-28 | “S” - Standard |
| PG 70-22 | PG 58H-28 | “H” - Heavy |
| PG 76-22 | PG 58E-28 | “E” - Extremely Heavy |

This table may be used to assist the Agency in selecting the appropriate mixture criteria given the traffic conditions.

|  |  |  |
| --- | --- | --- |
| ***Mixture Type*** | ***Type B*** | ***Type C*** |
| *Design ESAL* | *<3,000,000* | *≥3,000,000* |
| *AADT (Average Annual Daily Traffic)* | *<15,000* | *15,000 - 30,000* |
| *AADTT (Average Annual Daily Truck Traffic)\** | *<1700* | *≥1700* |
| ***Surface\*\**** | Mixture Size Designation | 9.5 mm12.5 mm | 9.5 mm12.5 mm |
| Recommended PG Binder | 58S-28 | 58H-28 |
| ***Intermediate*** | Mixture Size Designation | 12.5 mm19.0 mm | 12.5 mm19.0 mm |
| Recommended PG Binder  | 58S-28 | 58H-28 |
| ***Base*** | Mixture Size Designation | 19.0 mm25.0 mm | 19.0 mm25.0 mm |
| Recommended PG Binder | 58S-28 | 58S-28 |

\* Heavy trucks are commercial vehicles with 2+ axles and 6+ tires.

**\*\* *If a pay item is designated as a PG 58S-28 and a surface mixture has less than or equal to 15.0% binder replacement, the binder grade shall be 58H-28.***

PLEASE NOTE: Many local and Community Crossing projects have ESAL counts below 3,000,000 and will be Type B mixtures. It is imperative to provide the correct mixture designation on the project plans and specifications, e.g. HMA, Type B, 58S, Surface, 9.5 mm.

The plant discharge temperature for any mixture shall not be more than 315°F whenever PG 58S-28 and PG 58H-28 binders are used. The temperature of each mixture at the time of spreading shall not be less than 245°F. No mixture shall be placed on a previously paved course that has not cooled to less than 175°F. Warm mix asphalt (WMA) mixtures may be produced by using a water-injection foaming device or additives as specified and according to the manufacturers’ recommendations.

INDOT specifications allow a maximum of 25.0% binder replacement from RAP (recycled asphalt pavement) and RAS (recycled asphalt shingles) combined for all asphalt mixtures.

Asphalt wedge and leveling shall consist of surface or intermediate mixtures.

***CONSTRUCTION GUIDANCE***

**Subgrade, Subbase, Milling and Surface Preparation**

Prior to asphalt mixture placement, subgrade should be checked for adequate compaction with no visible water or movement. Subgrade should be firm, dry and unyielding under the pressure of construction trucks. A proof roll is recommended to check for soft areas and verify uniform subgrade stability.

Crushed aggregate material for subbase shall be uniformly compacted, smooth and clean prior to mixture placement.

Milled surface shall have uniform milling pattern. Care should be taken to minimize scabbing which can cause future delamination. Milled surface shall be inspected for integrity and areas with visible distress and fatigue cracking should be patched or repaired where necessary. Milled surface shall be swept or vacuumed prior to mixture placement.

Verify that roadway is graded properly to direct water to proper drainage or containment areas and minimize water puddling on surface. Utility structures shall be adjusted to proper grade.

Surfaces on which an asphalt mixture course is placed shall be clean and free from debris and vegetation at the time of mixture placement.

**Tack Coat**

Tack coat shall be uniformly applied across the entire width of pavement to be overlaid. The asphalt material shall be uniformly applied across the entire width of pavement to be overlaid and shall cover a minimum of 95% of the surface. Areas of inadequate coverage that create streaking or areas of excessive coverage that create ponding shall be corrected to obtain an even distribution. Contact surfaces of curbing, gutters, manholes and other structures shall be tacked. Sufficient time should be given for the tack to break and set to minimize tracking from hauling and laydown equipment.

**Asphalt Mixture Placement**

Segregation of aggregate in the mat should be minimized. Transverse and longitudinal joints shall be properly constructed.

The finished mat should be smooth with no deviations greater than ¼ inch over 10 feet. A continuous slope/grade between paver passes should be maintained. Roadway should be crowned appropriately to ensure proper drainage.

Truck bodies should arrive at the site tarped and clean of debris. Qualified material from INDOT’s list of Anti-Adhesive Materials (no diesel fuel) shall be used to clean equipment and hand tools.

**Compaction**

Proper compaction is the most critical part of asphalt installation as it impacts service life directly by increasing resistance to rutting and cracking. The mat shall be compacted with rollers immediately after the mixture has been spread and finished. A rolling pattern should be established by Contractor to achieve density targets. Number of rollers, sizes and types may vary depending on mixture type and depth, speed of production and weather. Mixture temperatures of mat should be monitored to ensure proper compaction. Extra compaction effort in handwork areas inaccessible to rollers may be needed.

Rollers shall not cause undue displacement, cracking, or shoving. The rolling pattern should be adjusted if detrimental results are observed.

To avoid scuffing, the mat should cool to a minimum of 160o F prior to allowing traffic on the freshly paved surface. Additional cooling time may be needed on hot summer days.

**Weather Limitations**

Asphalt mixture courses less than 1” are to be placed when the ambient and surface temperatures are 60o F or above. Asphalt mixture courses equal to or greater than 1” but less than 2” are to be placed when the ambient and surface temperatures are 45o F or above. Asphalt mixture courses equal to or greater than 2” are to be placed when the ambient and surface temperatures are 32o F or above. Mixture shall not be placed on a frozen subgrade. However, asphalt mixture courses may be placed at lower temperatures provided the density of the asphalt mixture course is monitored by the Contractor and approved by the Agency and Inspector.

**Asphalt Mixture Acceptance**

Verify correct, specified asphalt mixtures are delivered to project site. Asphalt mixture courses shall be installed at the specified compacted lift thickness. It is recommended to request an INDOT Type D certification to verify mixture types. For unit price contracts, truck delivery tickets should be collected to document tonnage placed.

A Type D certification shall be supplied by Contractor and shall list test results for air voids and binder content for material supplied to the project. A Type D certification shall be submitted to the Inspector each day asphalt material is received.

If the user has questions regarding this guide, APAI encourages you to contact the contractor located in your area. A list of APAI member firms and asphalt plant locations can be found on the APAI website at [www.asphaltindiana.org](http://www.asphaltindiana.org).